

THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ekkehard ROTH

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Group Art Unit : 1742

I.A. Filed : July 14, 2005

Examiner : Huda

For : METHOD FOR PRODUCING A FIBRE-COMPOSITE MATERIAL FOR
PRODUCING FIBRE-COMPOSITE COMPONENTS**AMENDMENT UNDER 37 C.F.R. 1.116
IN RESPONSE TO FINAL OFFICE ACTION DATED NOVEMBER 22, 2010**Commissioner for Patents
U.S. Patent and Trademark Office
Customer Service Window, **Mail Stop AF**
Randolph Building
401 Dulany Street
Alexandria VA 22314

Sir:

This is in response to the Final Office Action from the U.S. Patent and Trademark Office dated November 22, 2010, which sets a three month shortened statutory period for response until February 22, 2011.

Applicant notes that this reply is being filed prior to the expiration of the shortened statutory period for response so that an extension of time and the government fee associated therewith should not be necessary for maintaining the pendency of the application. However, if for any reason an extension of time is required, such as for entry of an Examiner's Amendment, the present submission should be interpreted to include the requisite Request for Extension of Time, and the Patent and Trademark Office is hereby authorized to charge any fee necessary to maintain the pendency of this application, including any required extension of time fee or any required claim fee, to Deposit Account No. 19-0089.

Amendments to the Claims appear in the Listing of Claims beginning on page 3 of this paper.

Remarks begin on page 6 of this paper.

Reconsideration and withdrawal of the restriction requirement and rejections of record are respectfully requested in view of the remarks presented herein.

AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) Method for producing a fiber-composite material for producing fiber-composite components, comprising combining reinforcement fibers, resin, and a filler, the filler consisting of the reinforcement fibers that have been at least one of ground or cut ~~so that reinforcement fibers and filler in the fiber-composite material consists of the reinforcement fibers and the filler consisting of the reinforcement fibers that have been at least one of ground or cut.~~

2. (Previously Presented) Method according to claim 1, wherein the filler consists of ground fibers having a particle size of less than 2 mm.

3. (Previously Presented) Method according to claim 1, wherein the filler consists of cut fibers having a size of less than 20 mm.

4. (Previously Presented) Method according to claim 1, wherein the at least one of ground and cut reinforcement fibers is mixed with the resin that forms a subsequent matrix of the fiber-composite component thereby forming a resin filler mixture.

5. (Previously Presented) Method according to claim 4, wherein the resin filler mixture is processed into a film.

6. (Previously Presented) Method according to claim 5, wherein the resin filler film is applied to a semi-finished textile product.

7. (Previously Presented) Method according to claim 6, wherein the resin filler film is introduced into a component mold before the semi-finished textile product is placed in the component mold.

8. (Previously Presented) Method according to claim 1, wherein the fiber-composite material is applied into a component mold or onto a semi-finished textile product in a spray method.

9. (Previously Presented) Method according to claim 8, wherein the semi-finished textile product sprayed with the resin filler material is also used for producing preforms.

10. (Canceled)

11. (Previously Presented) Method according to claim 6, wherein the semi-finished textile product comprises woven fabrics, braided fabrics, knitted fabrics, unidirectional fabrics or multiaxial laid fabrics.

12. (Previously Presented) Method according to claim 7, wherein the resin filler film comprises a preform.

13. (Previously Presented) The method according to claim 1, wherein the filler consists of ground fibers having a particle size of less than 2 mm, and cut fibers having a size of less than 20 mm.

14. (Withdrawn) Fiber-composite material produced by the method of claim 1.

15. (Withdrawn) Fiber-composite material produced by the method of claim 2.

16. (Withdrawn) Fiber-composite material produced by the method of claim 3.

17. (Withdrawn) Fiber-composite material produced by the method of claim 13.

18. (Withdrawn - Currently Amended) Fiber-composite material comprising reinforcement fibers, resin, and a filler consisting of the reinforcement fibers that are at least one

of ground or cut so that reinforcement fibers and filler in the fiber composite material consists of the reinforcement fibers and the filler consisting of the reinforcement fibers that have been at least one of ground or cut.

19. (Withdrawn) Fiber-composite material according to claim 18, wherein the filler consists of at least one of ground fibers having a particle size of less than 2 mm, and cut fibers having a size of less than 20 mm.

20. (Withdrawn) The fiber-composite material according to claim 18, wherein the filler consists of ground fibers having a particle size of less than 2 mm, and cut fibers having a size of less than 20 mm.

REMARKS

Upon entry of the present amendment, claims 1 and 18 will be amended so that claims 1-9 and 11-20 will remain pending, because claim 10 is a canceled claim having been canceled in a previous amendment. Claims 14-20 stand withdrawn from consideration as being directed to a non-elected invention.

By the amendment herein, claims 1 and 18 have been amended in the manner suggested by the Examiner in the Final Office Action. However, the word "combining" has been permitted to remain in the claim as it appears that this word was inadvertently omitted in the Examiner's suggestion.

Accordingly, entry of this amendment after final rejection is appropriate because it should not require further search and/or consideration, and is merely being made in the manner suggested by the Examiner. Accordingly, entry of the amendment is respectfully requested.

Reconsideration of the restriction requirement and rejections of record and allowance of the application in view of the following remarks are respectfully requested.

Claim of Foreign Priority

Applicant expresses appreciation for the acknowledgment of the claim of foreign priority as well as receipt of all certified copies in this national stage application.

Response To Restriction Requirement

Claims 14-20 stand withdrawn from consideration as being directed to a non-elected invention by the Examiner.

Applicant once again requests rejoinder of non-elected claims 14-20 upon allowance of the elected claims. In this regard, the present application is a national stage application and unity of invention rules, not U.S. practice, applies to the restriction requirement. Accordingly, upon allowance of the elected method claims, the Examiner is requested to consider rejoinder of the withdrawn product claims.

In view of the foregoing, it is respectfully requested that the Examiner reconsider the requirement for restriction upon allowance of the claims under prosecution.

Response To Rejection Under 35 U.S.C. 112, Second Paragraph

Claims 1-9 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

In this ground of rejection, it is contended that claim 1 is confusing because claim 1 states that the reinforcement fibers consist of itself, and the Examiner suggests language wherein the end portion of claim 1 is deleted.

In response, Applicant submits that claim 1 is definite as written; however, in order to advance prosecution of the application to allowance without expressing any agreement or acquiescence with the record of record, claim 1 has been amended in accordance with the Examiner's suggestion.

Accordingly, this ground of rejection should be withdrawn.

Response To Art-Based Rejections

The following three art based rejections are set forth in the Office Action.

(a) Claims 1, 3, 4 and 13 are rejected under 35 U.S.C. 102(a) as being anticipated by Sampson US 2005/0023727 A1.

(b) Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sampson, and further in view of U.S. Patent No. 4,284,596 to Inokuchi et al. (hereinafter "Inokuchi")

(c) Claims 5-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sampson, and further in view of U.S. Patent No. 4,883,624 to Spaay.

In response to these grounds of rejection, Applicant reminds the Examiner that independent claim 1 is directed to a method for producing a fiber-composite material for producing fiber-composite components, comprising combining reinforcement fibers, resin, and a filler, the filler consisting of the reinforcement fibers that have been at least one of ground or cut. Therefore, Applicant's claimed subject matter is directed to the filler consisting of the same material as the reinforcement fibers. Thus, the filler consists of the same material (e.g., carbon) that is also used for the reinforcement fibers to produce the fiber reinforcement layer, such as scrim (e.g., unidirectional, multiaxial), woven fabric, knitted fabric.

None of the documents used in the rejections of record appears to teach or suggest such claimed subject matter whether taken alone or in any combination.

Sampson merely discloses in paragraph [0002] that:

Materials such as composite structures may comprise fibers (whether woven, straight, randomized, long, or filamentary, or in any other shape or configuration) for fiber reinforcement, in addition to a matrix. The matrix can be, but is not limited to, polymeric resin or carbon resin (such as amorphous carbon resin), and may serve to provide adhesion among the fibers. Such fiber reinforcement composite structures (or fiber composites) are different from powder or particle composite structures which, instead of providing enhanced strength through fibers, provide enhanced strength through powdered or particulated reinforcement

material. Importantly, note that as used herein, fiber is intended to include not only long fibers as might be found in a fabric sheet of reinforcement fiber (e.g., carbon fiber) composite, but also filaments or short fibers that may be created by, e.g., a chopping of a sheet of long fibers into [1/4] inch long by 1 inch wide rectangles (as merely one example), or, e.g., a chopping of fiber tow into [1/4] inch lengths (as merely one example). A rough analogy that may be of some help in understanding the role fibers and the matrix play in composite materials is rebar reinforced concrete, where the fiber of a composite material can be conceptualized as analogous to the rebar and the matrix of a composite material can be conceptualized as analogous to the concrete.

Moreover, Sampson merely discloses in paragraph [0016]:

In at least one embodiment, short fiber may refer to fibers that are between (and including) [1/4] inch and 1 inch. In other embodiments, short may connote a different length range.

The anticipation rejection based upon Sampson does not point to any disclosure in Sampson of a method for producing a fiber-composite material which includes combining reinforcement fibers and a filler in a resin let alone filler consisting of the reinforcement fibers that are at least one of ground or cut. At most, the anticipation rejection merely contends that the resin of Sampson can comprise short fibers, but not that the resin of Sampson includes both reinforcement fibers as well as a filler that is the reinforcement fiber that is at least one of ground or cut reinforcement fibers. For example, the rejection does not establish that the composite materials of Sampson include both reinforcement fibers and a filler let alone both longer reinforcement fibers and shorter filler from reinforcement fibers that have been at least one of cut or ground.

In order to constitute a proper anticipatory reference, a reference must teach or suggest each and every feature of the claimed subject matter. Accordingly, the anticipation rejection is without appropriate basis and should be withdrawn.

Still further, with respect to claim 13, the rejection makes the unsupported assertion that ground fibers are inherently fibers that have been cut. The rejection provides absolutely no support for this assertion. In this regard, the Examiner is reminded that for inherency to be present, it must be the necessary result. However, the rejection does not establish that ground fibers are fibers that have been cut. Accordingly, if this ground of rejection is maintained, the Examiner is requested to provide the required support for the assertion of inherency.

Still further, the rejection does not address the claimed subject matter of the ground fibers having a particle size of less than 2 mm. In this regard, Sampson distinguishes over powder and particles in paragraph [0002], beginning at line 10 thereof, by indicating that, "Such fiber reinforcement structures (or fiber composites) are different from powder or particle composite structures....." Moreover, it appears that the smallest size of fiber that Sampson specifically discloses is ¼ inch. The rejection improperly does not establish that Sampson discloses ground fibers having a particle size of less than 2 mm. In fact, in the obviousness rejection of claim 2, it is admitted that Sampson does not disclose fibers having a size less than 2 mm.

Accordingly, for at least these additional reasons, the anticipation rejection should be withdrawn.

The obviousness rejections are also without appropriate basis for at least the reasons set forth above. Moreover, regarding the obviousness rejection of claim 2 based upon Sampson in view of Inokuchi, the rejection admits that Sampson does not teach fibers having a size of less than 2 mm, but contends that Inokuchi discloses such size.

In response, Applicant submits that one having ordinary skill in the art would not have combined Sampson and Inokuchi as asserted in the rejection. In this regard, the rejection improperly does not provide any sufficient reason for including ground fibers having a particle

size of less than 2 mm in Sampson when the smallest fiber size disclosed by Sampson is $\frac{1}{4}$ inch. In fact, Sampson specifically discloses in paragraph [0002] that his invention is different from composites that use powders or particles. Accordingly, one having ordinary skill in the art would not have included a particle size of less than 2mm as the short fibers of Sampson.

Therefore, for at least the reasons set forth above, the obviousness rejection of claim 2 is without appropriate basis and should be withdrawn.

Regarding the obviousness rejection of claims 5-9 and 11-12 based upon Sampson in view of Spaay, Applicant submits that one having ordinary skill in the art would not have combined the disclosures in the manner contended in the rejection. Moreover, even if the disclosures were combined, one having ordinary skill in the art would not have arrived at Applicant's claimed subject matter.

Sampson is directed to the desire to create load-bearing structures that are lighter and stronger than materials such as steel, aluminum, metals in general, with the indication that fiberglass, has been know in some industries for some time. Sampson discloses in paragraph [0015]:

The present invention includes a variety of aspects which may be selected in different combinations based upon the particular application or needs to be addressed. In one basic form, the invention discloses an autoclave (or other thermal) molding process to mold a part having a certain coefficient of thermal expansion, wherein the mold involves a sufficiently gas permeable material that serves as a mold foundation and that has a sufficiently matching coefficient of thermal expansion, in combination with a part molding element that also has a sufficiently matching coefficient of thermal expansion and that is made from short reinforcement fiber material (e.g., carbon fiber), with the intended effect that risk of unacceptable deformation such as breaking of the material to be molded is sufficiently abated. In another form, this invention may specifically involve the molding of a part having a relatively low coefficient of thermal expansion, such as a part made from a carbon composite, and thus the use of materials for the mold foundation and part molding element that have coefficients of thermal expansion that sufficiently match that of the part to be molded (and thus are also relatively low).